SNC Reference Number (enter if previously assigned)

## 4. PROJECT SUMMARY

**County: Fresno**
**Applicant: Sierra Nevada Research Center, Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, 2081 E. Sierra Avenue, Fresno**
**Project Title: Kings River Experimental Watershed: Research on Stream Water Quality and Forest Restoration in the Sierra Nevada**

### PROJECT GOAL

Sixty percent of California's water originates as small streams in the Sierra Nevada, yet very little information is known about how these streams are affected by management activities at the source. The tasks presented in this proposal would be performed within the framework of the Kings River Experimental Watershed (KREW), a long-term research study designed to: (1) quantify the variability of headwater stream ecosystems and their associated watersheds, and (2) evaluate the effects of fire and fuel-reduction treatments on the watersheds, particularly riparian and stream physical, chemical, and biological conditions. This proposal would provide partial support for data collection for an additional year of pre-treatment and a post-treatment year for the mechanical thinning. The proposed tasks represent critical information needed for management of forests in the southern Sierra Nevada.

### PROJECT SCOPE

The KREW is an integrated ecosystem project at the watershed scale designed and implemented by the Pacific Southwest Research Station (PSW), Forest Service, U.S. Department of Agriculture. Ten locations are currently instrumented and would be used for the proposed research—eight headwater streams and two downstream integrating stream reaches. Forest thinning (2009) and prescribed fire (2010-2011) treatments are planned to restore this southern Sierra, mixed-conifer ecosystem to a more sustainable condition similar to an 1850s forest structure (before gold rush impacts) and re-establish frequent fire disturbance processes. Five years of baseline (pre-treatment) data have been collected.

*Task 1*. Quantify total sediment yields from KREW streams and identify sediment sources. Sediment sources include hill slopes, stream banks, headcuts, and roads. Techniques/methods include the use of sediment basins in the stream, sediment fences along roads and on slopes, and turbidity probes. Much of the proposed work would consist of data analyses, erosion modeling, and writing up results to guide future management.

*Task 2*. Analyze water chemistry for 10 streams, four soil-water sites, seven precipitation/snowmelt sites, and 477 points for water flux on the eight watersheds. Analyses include nutrients and all major cations and anions.

*Task 3*. Sample and analyze stream benthic algae in 2010 after thinning treatments and compare to baseline samples from 2002 and 2005. This work would be performed by the U.S. Geological Survey in Sacramento, CA, for consistency with previous analyses. Benthic algae are expected to be the most sensitive biological indicator of change in the experimental streams.

*Task 4*. Host a public symposium on all KREW research findings in year two. Materials would be developed and presented for both non-scientists and scientists. Close collaboration would occur between Dr. Hunsaker and the Sierra Nevada Conservancy in the planning and implementation of this task to ensure it reaches a broad audience. Publications would be distributed.
*Task 5*. Report on performance measures and provide 6-month and annual progress reports on tasks 1 through 4. Provide a comprehensive final report by 3/2012.

## LETTERS OF SUPPORT

Dennis Hall, Staff Chief Forest Practice, CalFire, The Resources Agency, State of CA
John Mount, Forest Resources Manager, Southern California Edison
Teryle Sandridge, President, Sierra Resource Conservation District
Roger Bales, Director Sierra Nevada Research Institute, Univ. CA, Merced

## SNC PROJECT DELIVERABLES AND SCHEDULE

| DETAILED PROJECT DELIVERABLES | TIMELINE |
|---|---|
| | Start date 3/2009 |
| 6-month progress reports including quantification of performance measures and details of Tasks 1 through 4 | 8/2009, 3/2010, 8/2010, 3/2011, 8/2011, 3/2012 |
| Hold symposium and provide materials (Task 4) | 2/2010 |
| Published symposium report | 2011 |
| Journal manuscript on soil erosion and sediment yield in southern Sierra Nevada headwaters (Task 1) | 2009 |
| Journal manuscript on water chemistry in southern Sierra Nevada headwaters (Task 2) | 2010 |
| Algae final report and journal manuscript (Task 3) | 1/2012 |
| **Final Project Report** | **3/2012** |

## SNC PROJECT COSTS (rounded to nearest hundred dollars)

| PROJECT BUDGET CATEGORIES (3-year project period) | TOTAL SNC FUNDING |
|---|---|
| Task 1. Salary hydrological technician, soil erosion data collection, modeling, and sediment budget development | $102,500.00 |
| Task 2. Chemical analyses, salary, materials, and supplies | $217,300.00 |
| Tasks 3. Algae survey, collection, identification, report writing USGS interagency agreement | $68,000.00 |
| Task 4. Symposium and outreach | $10,000.00 |
| Task 5. Reporting on performance measures included in salary of technician under task 1 | $0.00 |
| PSW indirect--12 % for in-house costs | $39,600.00 |
| PSW indirect--3 % for pass through dollars | $2,100.00 |
| **SNC GRANT TOTAL** | **$439,500.00** |